

CHAPTER 3C. OBJECT MARKERS

Section 3C.01 Object Marker Design and Placement Height

Standard:

Paragraphs 5 (“When used for...”) and 6 (“When used to...”) are deleted. Figure 3C-101 shall be used for mounting height of object markers.

In Paragraph 2 (“When used...”), the following types of object markers are added:

CA Type L Utility Pole marker shall be yellow retroreflective material consisting of three 50 x 300 mm (2 x 12 in) horizontal rectangles arranged vertically on a utility pole as shown in Figure 3C-101.

CA Type Q object marker shall be a vertical tubular marker, with a height of 450 to 600 mm (18 to 24 in) and a minimum cross sectional dimension of 57 mm (2 ¼ in). The yellow retroreflective material shall consist of three bands, each 75 mm (3 in) in height or a single band 225 mm (9 in) in height as shown in Figure 3C-101.

CA Type R (OM-3C) object marker size shall be 600 x 750 mm (24 x 30 in).

Support:

A cross-reference of object markers is shown in Table 3C-101.

Section 3C.02 Markings for Objects in the Roadway

The following is added to this section:

Option:

Objects in a paved area within 2.4 m (8 ft) of the traveled way may be marked with a CA Type P (OM-3L, OM-3R) or CA Type R (OM-3C) object marker.

The CA Type Q object marker may be used to emphasize objects within the roadway, for example, curb noses, where it is desirable that the marker be visible from all directions.

Guidance:

If any object marker is located behind the guard rail, all of the marker panel should be visible to approaching traffic.

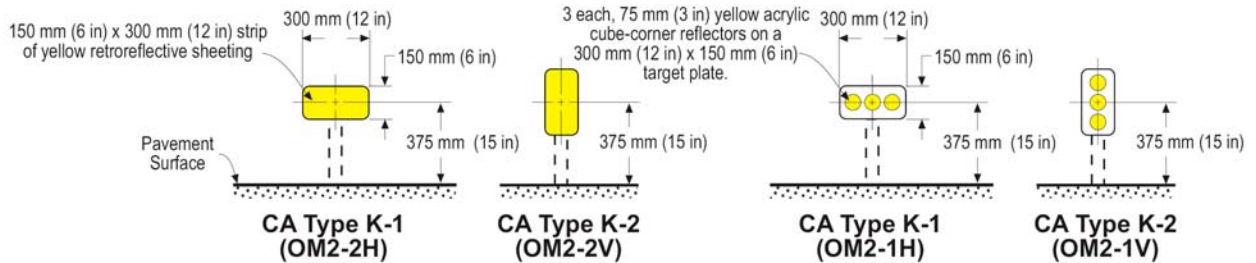
The CA Type P (OM-3L, OM-3R) object marker should be in line with the inner edge of the obstruction.

Table 3C-101. Cross-Reference of Object Markers

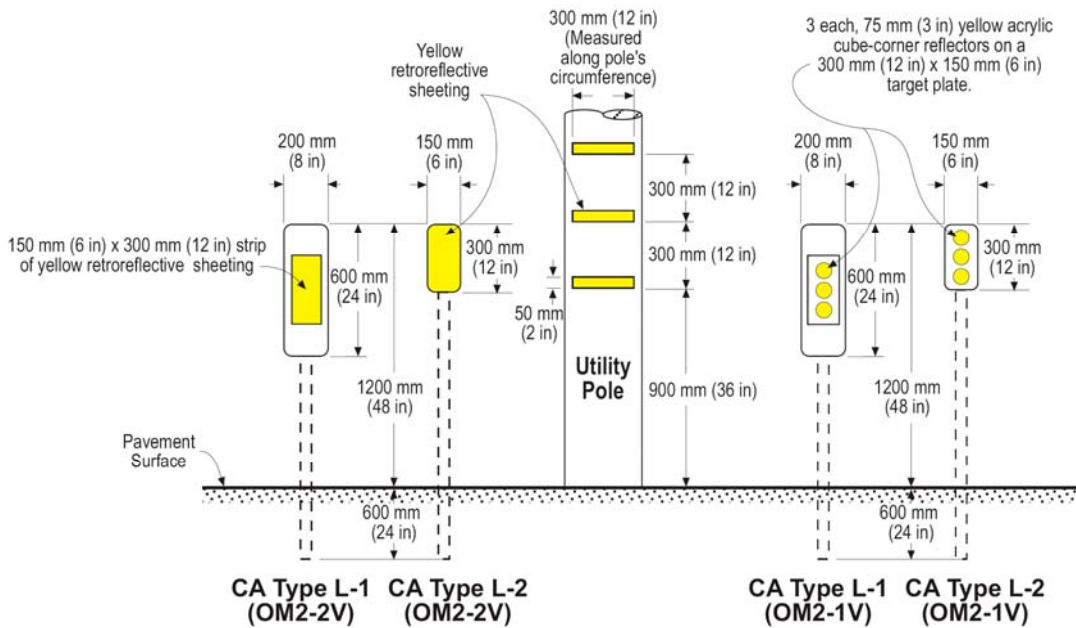
California Type	MUTCD Code	Title	Supplement Section	MUTCD Section
K-1	OM2-2H	Typical CA Type K Object Marker	None	3C.01, 3C.03
K-2	OM2-2V	Typical CA Type K Object Marker	None	3C.01, 3C.03
L-1	OM2-2V	Typical CA Type L Object Marker	3C.01, 3C.03	None
L-2	OM2-2V	Typical CA Type L Object Marker	3C.01, 3C.03	None
N-1	OM1-3	Typical CA Type N Object Marker	2C.09, 2C.38, 3C.03, 6F.108	3C.01, 3C.02
N-2	OM4-3	Typical End-of-Roadway Marker	2C.21, 3C.04	3C.04
P	OM-3L and OM-3R	Typical CA Type P Object Marker	3C.02, 6F.108	3C.01, 3C.02
Q	None	Typical CA Type Q Object Marker	3C.01, 3C.02	None
R	OM-3C	Typical CA Type R Object Marker	3C.01, 3C.02	3C.01, 3C.02
Utility Pole	None	Typical CA Type L Object Marker	3C.01, 3C.03	None

**Figure 3C-101. Examples of Object Markers
(Sheet 1 of 2)**

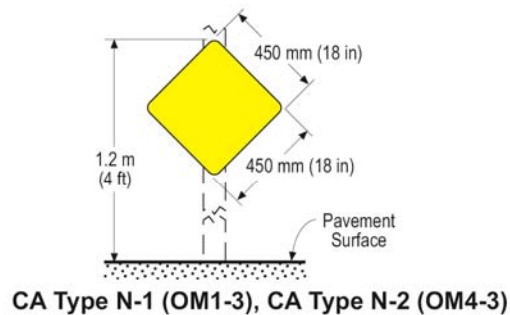
Typical CA Type K Object Marker



Typical CA Type L Object Marker



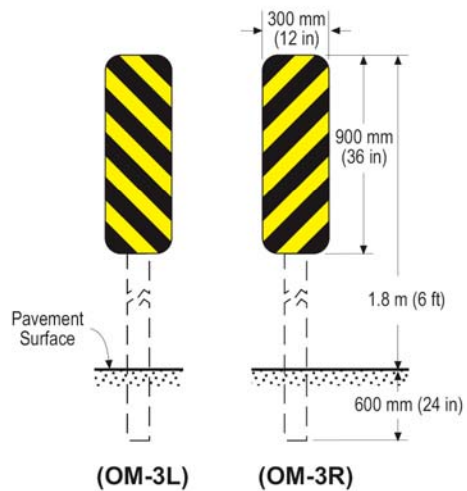
Typical CA Type N Object Marker



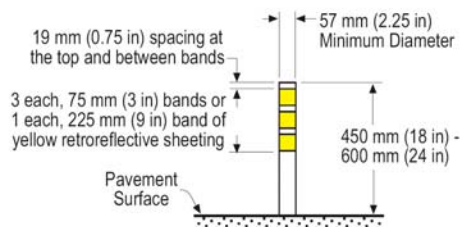
NOT TO SCALE

**Figure 3C-101. Examples of Object Markers
(Sheet 2 of 2)**

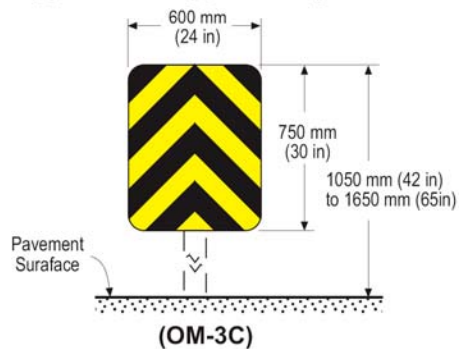
Typical CA Type P Object Marker



Typical CA Type Q Object Marker



Typical CA Type R Object Marker



NOT TO SCALE

Figure 3C-1. Object Markers and End-of-Roadway Markers**Standard:**

The Typical Type 3 Object Marker (OM-3C) shown in this MUTCD figure shall not be used in California. The CA Type R Object Marker (OM-3C) (size 600 x 750 mm (24 x 30 in)) as shown in Figure 3C-101 shall be used instead.

Section 3C.03 Markings for Objects Adjacent to the Roadway

The following is added to this section:

Option:

Objects outside of the paved shoulder, within 3.6 m (12 ft) of the traveled way, may be marked with CA Type L object markers.

The CA Type L (OM2-2V and OM2-2H) object markers may be placed in front of, alongside of, or attached to the object. Where objects are very close to each other, only the first object may need to be marked.

The CA Type L Utility Pole marker may be used to mark a utility pole.

Standard:

If used on State highways, CA Type L-1 (OM2-2V) object marker shall be used instead of CA Type L-2 (OM2-2V).

Guidance:

If used, the utility company should be responsible for installing and maintaining the CA Type L Utility Pole marker.

Support:

See Section 2C.09 and 2C.38 for use of CA Type N-1 (OM1-3) object markers in conjunction with One-Directional Large Arrow (W1-6) and Two-Direction Large Arrow (W1-7) signs for abrupt changes in the roadway alignment.

See Section 6F.108 for use of CA Type N, P and R object markers for temporary traffic control.

Section 3C.04 End-of-Roadway Markers**Standard:**

Paragraph 3 (“The end-of-roadway...”) is deleted and replaced with the following:

The end-of-roadway marker shall be used at the end of a road or cul-de-sac street where there is no alternate vehicular path.

Paragraph 5 (“The minimum mounting...”) is deleted. Figure 3C-101 shall be used for mounting height of the end-of-the-roadway marker.

The following is added to this section:

Support:

See Section 2C.21 for use of end-of-roadway marker in conjunction with END (CA Code W31) sign.

CHAPTER 3D. DELINEATORS

Section 3D.02 Delineator Design

The following is added to this section:

Support:

There are two classes of delineator posts and several types of retroreflectorization as shown in Figure 3D-101.

Section 3D.03 Delineator Application

Standard:

Paragraph 6 (“Double or vertically...”) is deleted.

Paragraph 7 (“Red delineators...”) is deleted. In California, red markers are used for wrong-way traffic, not delineators.

The following is added to this section:

Option:

Where delineation is required within a paved area, surface mounted channelizers may be used. See Section 3F.02.

Standard:

The color of the delineator retroreflectors shall conform to the color of edge lines except for the use of yellow on the right at narrow bridges and red at truck escape ramps.

Support:

Examples of the use of delineators are shown in Figure 3D-101. Color exceptions are shown in Figure 3D-103 and 3D-104.

Following are typical delineators and their uses:

- Type E - White Retroreflector (2 Sided). For use on the left or right of 2-lane 2-way streets and highways when it is desirable to have a reflector on the front, and one on the back of the delineator facing the opposite direction of traffic.
- Type F - White Retroreflector (1 Sided). For use on the right of freeways and expressways. They may also be used on 2-lane 2-way streets and highways when the Type E is not needed.
- Type G - Yellow Retroreflector (1 Sided). For use on the left of divided highways and 2-lane highway intersections as shown in Figure 3D-102.
- Type I - Yellow Retroreflector (2 Sided). For use at approaches to narrow bridges as shown in Figure 3D-104.
- Type J - Red Retroreflector (1 Sided). For placement on both sides of Truck Escape Ramps as shown in Figure 3D-103.

Section 3D.04 Delineator Placement and Spacing

Guidance:

In Paragraph 1 (“Delineators should...”) second sentence (“They should be...”), the phrase “0.6 to 2.4 m (2 to 8 ft)” is changed to “0.6 to 1.8 m (2 to 6 ft)”.

Paragraph 3 (“Delineators should be spaced...”) is deleted and replaced with the following:

Delineators should be spaced 160 m (530 ft) apart on mainline tangent sections. Delineators should be spaced 60 m (200 ft) apart on ramp tangent sections.

The following is added to this section:

Guidance:

Installations should be inspected at night to ensure that there are no confusing or misleading delineators.

Standard:

Unless local conditions justify otherwise, delineators shall be placed on all State highways.

Guidance:

Delineators should also be provided on all city and county roads.

When used, delineators should be placed as follows:

- a On the outsides of highway curves of 915 m (3000 ft) radius or less (including medians in divided highways), freeway exit and entrance ramps and connectors. Exception to this, is where a median barrier is delineated as shown in the Median Barrier Delineation Detail in Figure 3D-105. Delineator spacing on curves is shown in Figure 3D-1 and Table 3D-1.
- b On the right of tangent sections of freeway entrance and exit ramps, collector roads, freeway connectors and lane reduction transition sections at 60 m (200 ft) spacing.
- c On embankments higher than 3.0 m (10 ft) and with side slopes steeper than 1:4. Delineator spacing is approximately 160 m (525 ft).
- d On approaches to narrow bridges as shown in Figure 3D-104.
- e On tangent sections of rural State highways where there are no reflective pavement markers, such as in snow areas. Delineator spacing is approximately 160 m (525 ft).
- f On all new guardrail or bridge rail installations, or when maintenance is required on existing guardrail or bridge rail, within 3.66 m (12 ft) of the edge of traveled way and curves of 915 m (3000 ft) radius or less. The spacing on tangent sections is approximately 160 m (525 ft). For spacing on curves, see Figure 3D-1 and Table 3D-1.

Option:

Delineators may also be placed as follows:

- a At intersections, road approaches, and median openings, as shown in Figure 3D-102.
- b On sections of highway with non-standard shoulder width.

Section 3D.101 Culvert Markers**Support:**

Culvert markers are placed as a convenience to maintenance crews in marking locations of culvert openings. Such marking is sometimes necessary to protect culvert ends from damage from adjacent operations as well as to serve as an aid in locating culverts during storm conditions.

Refer to Department of Transportation's Maintenance Manual, Chapter M5 (Traffic Safety Devices) for more information on culvert markers. See Section 1A.11 for information regarding this publication.

Option:

Culvert markers may be placed on both sides of the highway at those culverts where they are necessary.

Guidance:

Culvert markers should be so placed as not to interfere with a line of delineators.

Standard:

Culvert markers shall not be retroreflective, or contain kilometer post marker information.

Section 3D.102 Emergency Passageway Marker**Support:**

Except for emergency passageways in median barriers, median openings are not allowed on freeways.

Refer to Department of Transportation's Traffic Manual, Section 7-04.7 for design considerations of emergency passageways. See Section 1A.11 for information regarding this publication.

Guidance:

Where freeway median passageways are provided for emergency vehicles, delineation for the crossover should be as follows:

- a At a point, 320 m (1/5 mi) in advance of the crossover, one Class 1 Delineator, with a yellow post and two 75 x 300 mm (3 x 12 in) white retroreflectors stacked vertically (600 mm (24 in) of white retroreflectance), should be placed on the left side of the through roadway facing approaching traffic.

- b At a point, 160 m (1/10 mi) in advance of the crossover, one Class 1 Delineator, with a yellow post and two 75 x 300 mm (3 x 12 in) yellow retroreflectors stacked vertically, should be placed on the left side as in (a).
- c At the far side of the crossover, one Class 1 Delineator, with a yellow post and one 75 x 300 mm (3 x 12 in) white retroreflector over one 75 x 300 mm (3 x 12 in) yellow retroreflector stacked vertically, should be placed on the left side as in (a).

Section 3D.103 Narrow Bridge Signing and Marking

Support:

The placement of warning signs, object markers, delineators, and edge lines at narrow bridges is dependent upon the width of the bridge and approach roadway.

Standard:

Narrow bridge signing and marking shall conform to the details shown in Figure 3D-104.

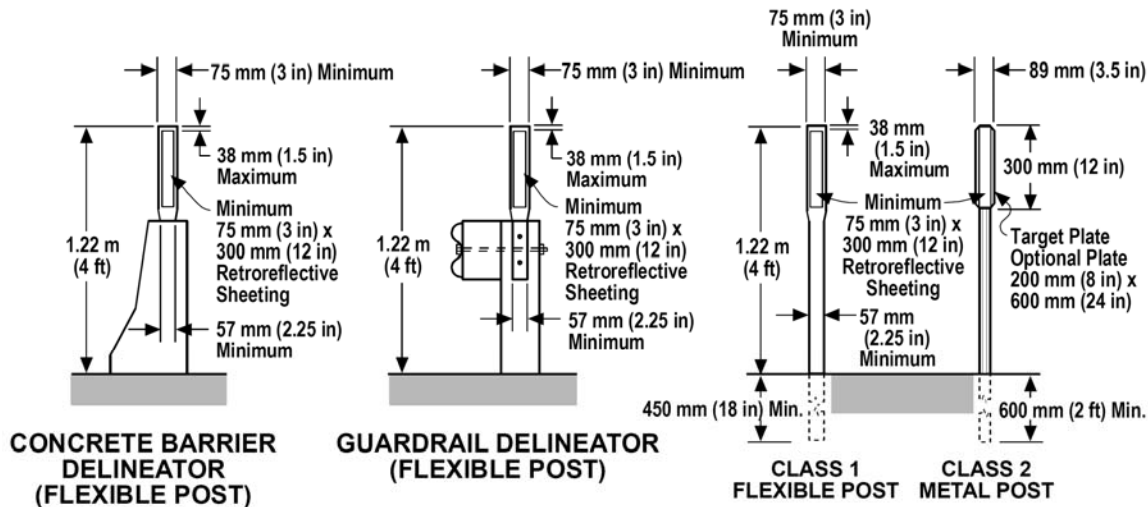
Section 3D.104 Median Barrier Delineation

Guidance:

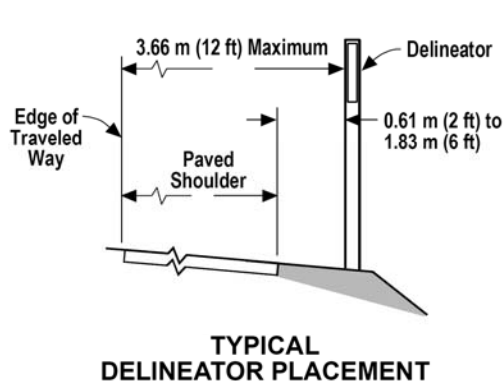
Median barriers should be delineated when the clearance between the barrier and the edge of traveled way is less than 2.44 m (8 ft).

In general, when delineated, it should be with an approved median barrier marker, the same color as the left edge line. They should be placed on top of the barrier at 14.64 m (48 ft) centers.

Markers placed on the sides of barriers, near the splash zone, should be avoided because of the tendency to collect dirt which reduces their effectiveness. See Figure 3D-105.

Figure 3D-101. Examples of Delineators

NOT TO SCALE

**TYPES OF DELINEATORS**

TYPE	RETROREFLECTOR COLOR	
	FRONT	BACK*
E	WHITE	WHITE
F	WHITE	NONE
G	YELLOW	NONE
I	YELLOW	YELLOW
J	RED	NONE

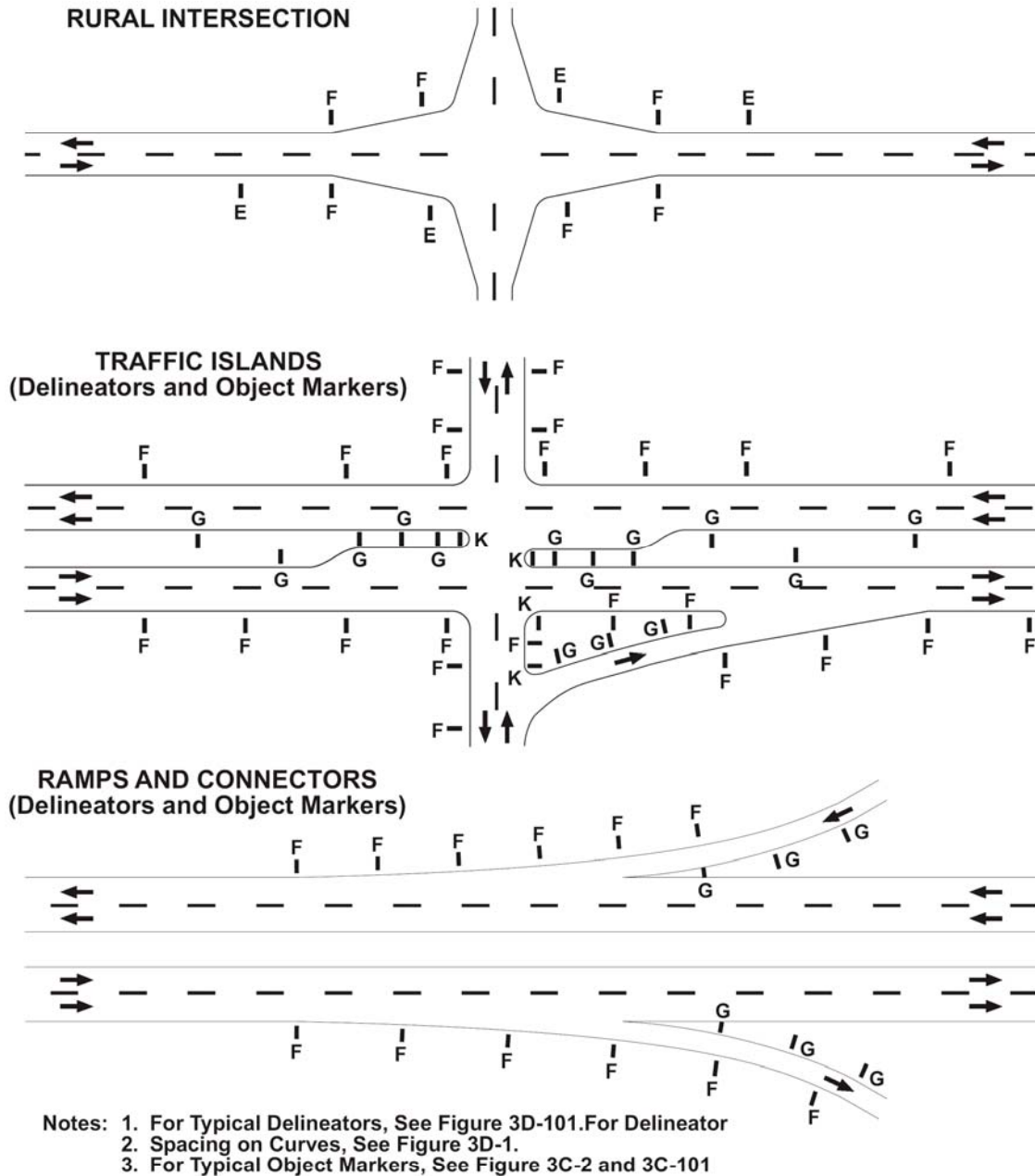
***Back Retroreflector:**

Class 1 Delineator - 75 mm (3 in) ± square of retroreflective sheeting.
 Class 2 Delineator - 75 mm (3 in) ± acrylic cube-corner retroreflective

Notes:

1. Class 1 (Flexible Post) Delineators are standard on State highways, except for certain locations, e.g., snow or protected areas behind guardrail, etc. The color of the post is white.
2. Class 1 (Flexible Post) Delineators used in construction or maintenance zones shall be orange with white retroreflective sheeting. However, if the delineators are to remain in place as a permanent roadway feature after the construction or maintenance period, the color of the post shall be white with the appropriate color of retroreflective sheeting as specified in Section 3D.03.
3. The Type of Retroreflective Element and Class of Post is designated as E-1, F-2, etc.

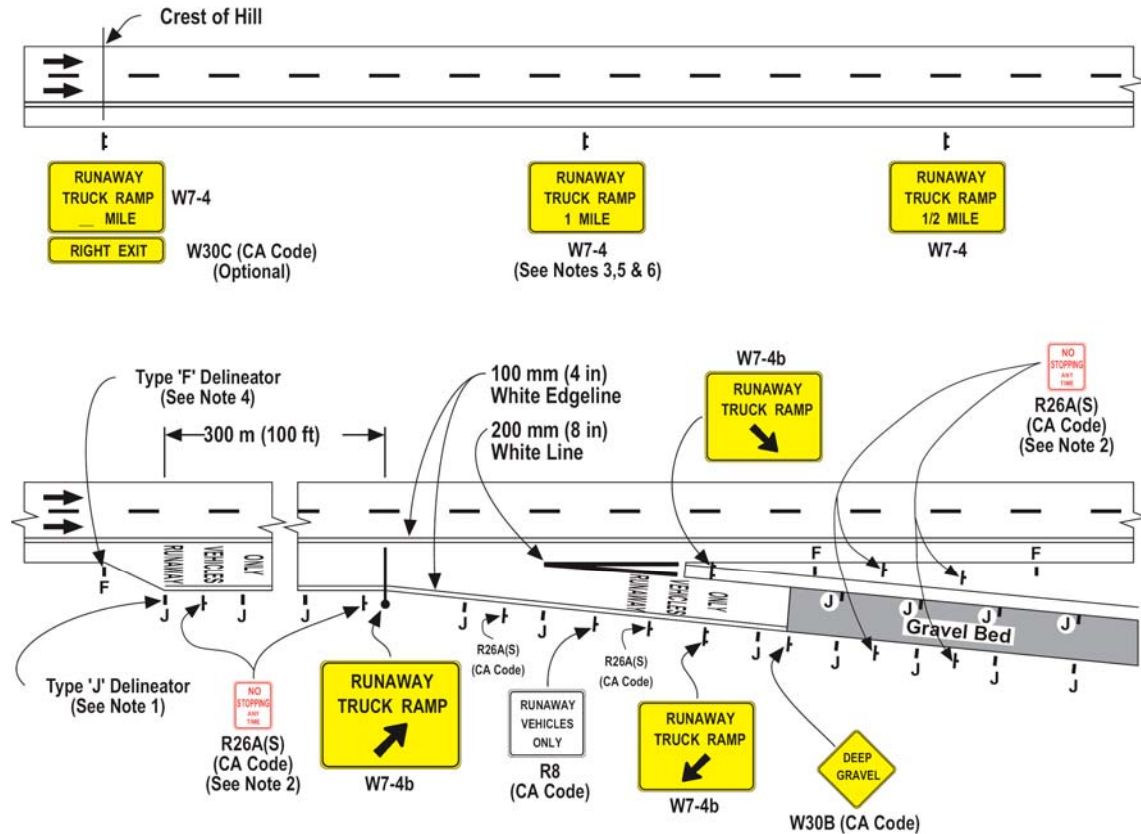
Figure 3D-102. Examples of Delineator Placement When Used at Intersections, Islands, Ramps, and Connectors



LEGEND

K = CA Type K Object Marker
 ← Direction of Travel

E, F, G = Types of Delineators
 NOT TO SCALE

Figure 3D-103. Examples of Runaway Truck Ramp Signs and Markings**Notes:**

1. Place Type 'J' Delineators at 15 m (50 ft) centers. See Figure 3D-101.
2. Place NO STOPPING ANY TIME, R26A(S) signs at 75 m (250 ft) centers.
3. Additional RUNAWAY TRUCK RAMP 1 MILE and RUNAWAY TRUCK RAMP 1/2 MILE, W7-4 signs may also be placed in the median on a one-way roadway.
4. Place 3 - Type 'F' Delineators at 150 m (500 ft) centers, preceding and following the Runaway Truck Ramp. See Figure 3D-101.
5. Additional advance RUNAWAY TRUCK RAMP (2 MILES, 3 MILES, etc.) W7-4 signs may be added as necessary.
6. Overhead signs may be substituted for ground mounted signs.

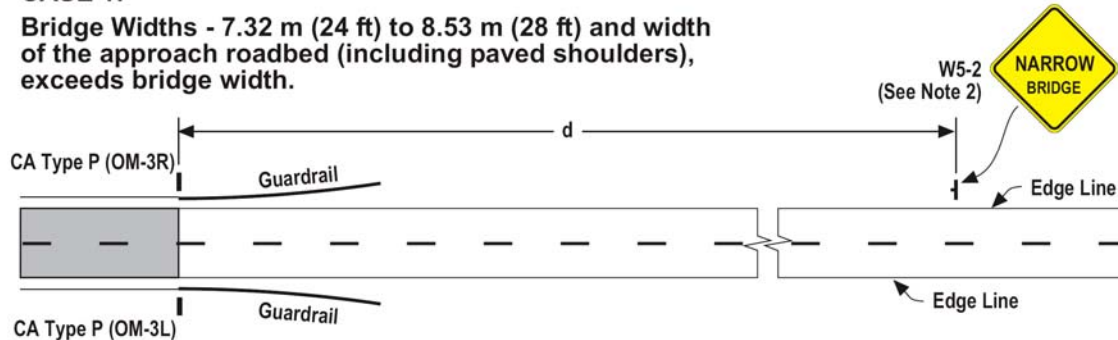
LEGEND

← Direction of Travel
NOT TO SCALE

**Figure 3D-104. Narrow Bridge Signs and Markings
(One-Way and Two-Way Roadways)**

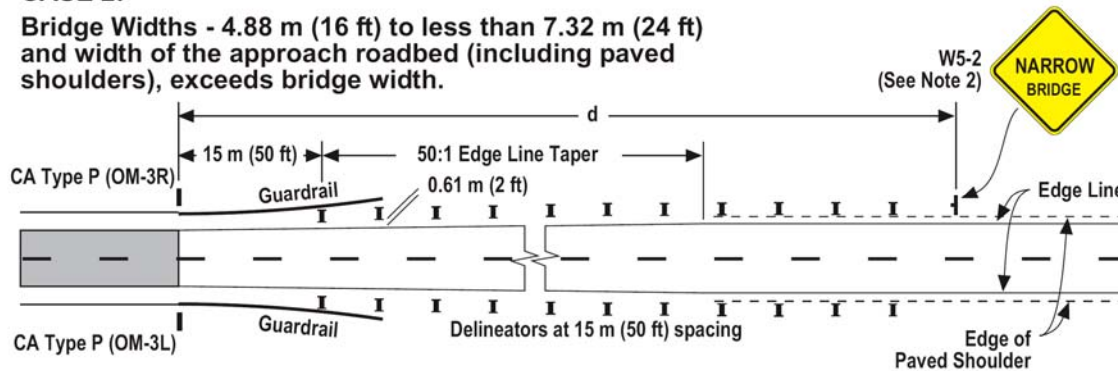
CASE 1:

Bridge Widths - 7.32 m (24 ft) to 8.53 m (28 ft) and width of the approach roadbed (including paved shoulders), exceeds bridge width.



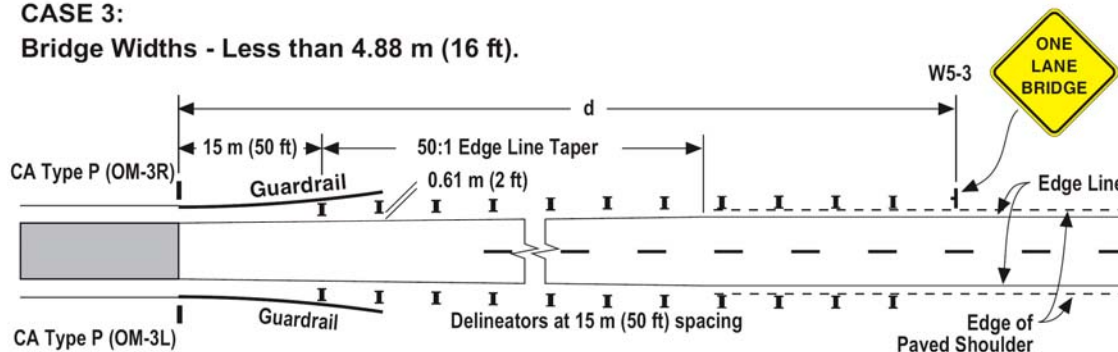
CASE 2:

Bridge Widths - 4.88 m (16 ft) to less than 7.32 m (24 ft) and width of the approach roadbed (including paved shoulders), exceeds bridge width.



CASE 3:

Bridge Widths - Less than 4.88 m (16 ft).

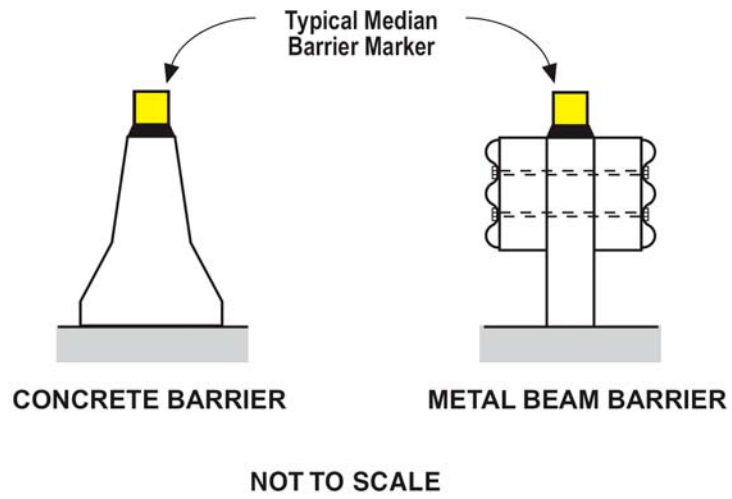


- Notes: 1. The Edge Line shall be continued across all bridges on State highways.
2. The NARROW BRIDGE (W5-2) sign should be erected on the right and in the median on a one-way roadway.
3. Delineators shall be continued across the bridge in Cases 2 and 3.

LEGEND

I = CA Type P Object Marker. See Figure 3C-101. I = Delineators (Type "G" for One-Way Roadways and Type "I" for Two-Way Roadways). See Figure 3D-101.
d = Advance Placement Distance (see Section 2C.05)
NOT TO SCALE

Figure 3D-105. Examples of Median Barrier Delineation



CHAPTER 3E. COLORED PAVEMENTS

Support:

No Comments.

This MUTCD Chapter is adopted as is for California.

CHAPTER 3F. BARRICADES AND CHANNELIZING DEVICES

Section 3F.02 Channelizing Devices

Standard:

Paragraphs 1 (Channelizing devices...) through 9 (“When 700 mm...”) are deleted and shall not be applicable in California. In California, cones are used for temporary traffic control, not as permanent channelizing devices.

The following is added to this section:

Support:

Channelizers are flexible retroreflective devices for installation within the roadway to discourage motorists from crossing a line or area of the roadway. Unlike delineators, which indicate the roadway alignment, channelizers are intended to provide additional guidance and/or restriction to traffic by supplementing pavement markings and delineation.

Option:

Channelizers may be used for additional emphasis to discourage median crossings at traffic islands and at lane separations.

Standard:

The design of a channelizer shall be as shown in Figure 3F-101.

The retroreflective unit used on channelizers shall be a minimum of 75 x 300 mm (3 x 12 in). The 75 x 300 mm (3 x 24 in) minimum retroreflective unit shall be visible at 300 m (1000 ft) at night under illumination of legal high beam headlights, by persons with vision of or corrected to 20/20. Refer to Department of Transportation’s Standard Specifications Section 12-3.07. See Section 1A.11 for information regarding this publication.

The post shall be flexible with a 57 mm (2 ¼ in) minimum width, except that the portion containing the retroreflective unit shall be a minimum width of 75 mm (3 in). The post shall be a minimum height of 900 mm (36 in) above the pavement on State highways.

Channelizer posts used for temporary traffic control shall be orange with white reflectors. See Section 6F.101.

If the channelizers are to remain in place as a permanent roadway feature, the post shall be white and the color of the reflector shall conform to that of the pavement markings it supplements with the following exceptions:

- **Retroreflective units used in narrow bridge shoulder tapers shall be yellow as shown in Figure 3D-104.**
- **Retroreflective units shall be white when used in construction and maintenance zones (posts shall be orange). See Section 6F.101.**

Option:

At locations where speeds are 65 km/h (40 mph) or less a minimum post height of 700 mm (28 in) may be used.

Support:

Since channelizers require closer spacing, their post size requirements differ from those of delineators.

There are two basic types of channelizers: one attaches to the pavement and the other attaches to an anchoring device imbedded in the pavement. Both the base and anchor systems are designed to permit replacement of the channelizer post. See Figure 3F-101.

Guidance:

Channelizers should be placed a minimum of 0.61 m (2 ft) from the traffic line, away from traffic, to allow for future maintenance of the line.

Option:

Space limitations may dictate exceptions to this criteria. At certain locations, placement directly on the traffic line may be required.

Support:

Spacing of the channelizers depends on the type of facility where they are to be used, the speed and volume of traffic, and the alignment to be channelized. Spacing which results in a visual fence/barrier effect is a key factor in channelizer installation.

Guidance:

The maximum post spacing should be 30 m (100 ft) on carpool lanes where channelizers are used primarily to delineate the separation between the carpool lane and the main facility.

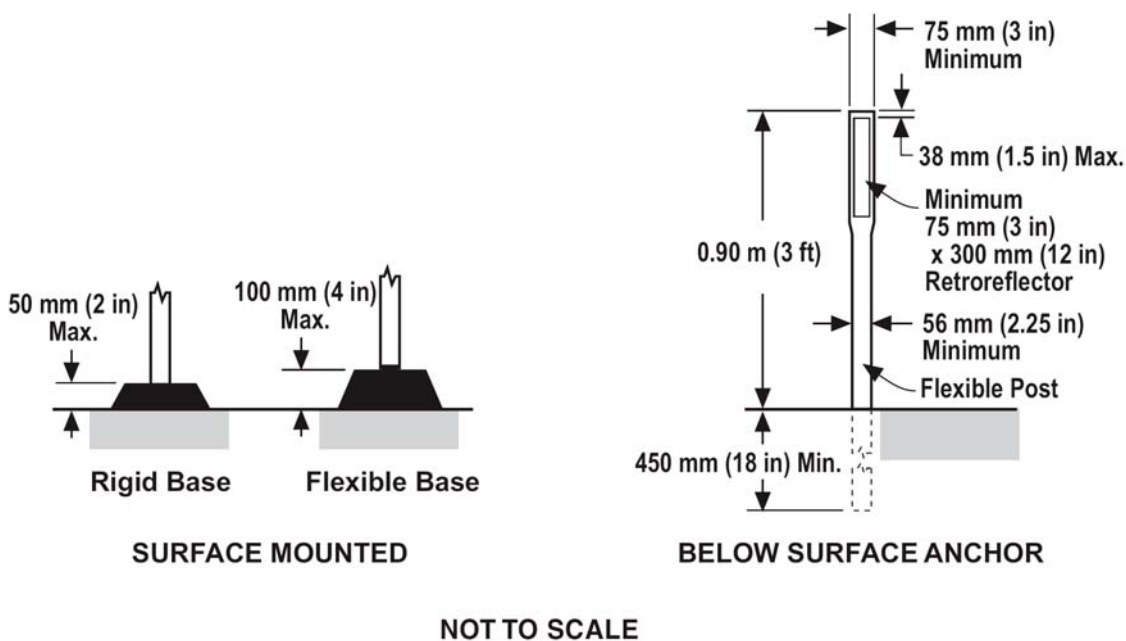
In locations where a relatively high number of violations occur, the post spacing should be 7.5 m (25 ft).

Option:

Where barrier violations are relatively minimal, a post spacing of 15 m (50 ft) may be adequate. However, spacing in excess of 15 m (50 ft) is of negligible value as a deterrent to intentional barrier violations.

Post spacing closer than 7.5 m (25 ft) may be considered on lower speed roads, urban streets and at specific locations such as traffic islands.

Figure 3F-101. Example of Channelizers



CHAPTER 3G. ISLANDS

Section 3G.01 General

The following is added to this section:

Support:

On State highways, criteria for the design of islands are set forth in Department of Transportation's Highway Design Manual. See Section 1A.11 for information regarding this publication.

Section 3G.02 Approach-End Treatment

Standard:

Paragraphs 2 ("Approach-end markings...") through 6 ("Pavement markings...") are deleted for application in California. Use Section 3B.106 for the rumble strips topic, instead.

Section 3G.03 Island Marking Application

Standard:

The Option and Guidance topics shall be deleted for application in California. Use Section 3B.106 for the rumble strips topic, instead.

Paragraphs 3 ("As indicated...") and 4 ("When raised bars...") are deleted for application in California. Use Section 3B.106 for the rumble strips topic, instead.

The following is added to this section:

Standard:

Double solid 100 mm (4 in) wide yellow lines shall be used to delineate the edge of a median island where the median is an all-paved, at-grade section of the highway. The island formed by double yellow lines shall be at least 0.61 m (2 ft) in width, as shown in Figure 3A-107.

When used, other markings in the median island area shall be yellow.

Support:

This treatment is not intended for freeways or other highways with a positive barrier in the median. Single solid yellow left edge line and markers as shown in Figure 3A-105 are standard.

The use of channelizing lines are shown in Figure 3A-112 and no-passing markings are shown in Figures 3A-104 and 3B-13.

Section 3G.06 Island Delineators

Standard:

Paragraph 1 ("Delineators installed...") is deleted and replaced with the following:

Delineators installed on islands shall be the same colors as the related edge lines.

Support:

In California, red markers are used for wrong-way traffic, not delineators.